

## 30V P-Channel Enhancement Mode MOSFET

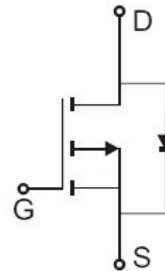
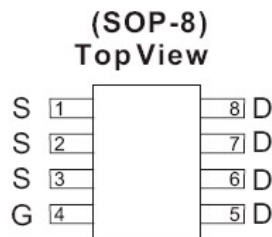
- **Features**

- 1.-30V/-5.3A,  $R_{DS(ON)_{TYP}}=45m\Omega$  @ $V_{GS}=-10V$
- 2.-30V/-4.2A,  $R_{DS(ON)_{TYP}}=65m\Omega$ @ $V_{GS}=-4.5V$

- **General Description**

The FS9435 is the P-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone, notebook computer power management and other battery powered circuits, and low in-line power loss that are needed in a very small outline surface mount package.

- **Pin Configurations**



- **Absolute Maximum Ratings @ $T_A=25^{\circ}C$  unless otherwise noted**

| Absolute Maximum Ratings ( $T_A=25$ Unless Otherwise Noted)        |          |            |             |
|--|----------|------------|-------------|
| Parameter  | Symbol   | Limits     | Units       |
| Drain-Source Voltage   | $V_{DS}$ | -30        | V           |
| Gate-Source Voltage  | $V_{GS}$ | 20         | V           |
| Continuous Drain Current   | $I_D$    | -5.3       | A           |
| Pulsed Drain Current <sup>(1)</sup>                                | $I_{DM}$ | -20        | A           |
| Maximum Power Dissipation  | $P_D$    | $T_A=25$   | 2.5         |
|  |          | $T_A=70$   |             |
| Operating Junction Temperature                                     | $T_J$    | -55 to 150 | $^{\circ}C$ |
| Junction-to-Case Thermal Resistance                                | $R_{JC}$ | 30         | $/W$        |
| Junction-to-Ambient Thermal Resistance (PCB mounted) <sup>2)</sup> | $R_{JA}$ | 50         | $/W$        |

Notes:

- 1. Maximum DC current limited by the package
- 2. 1-in<sup>2</sup> 2oz Cu PCB board

# FS9435

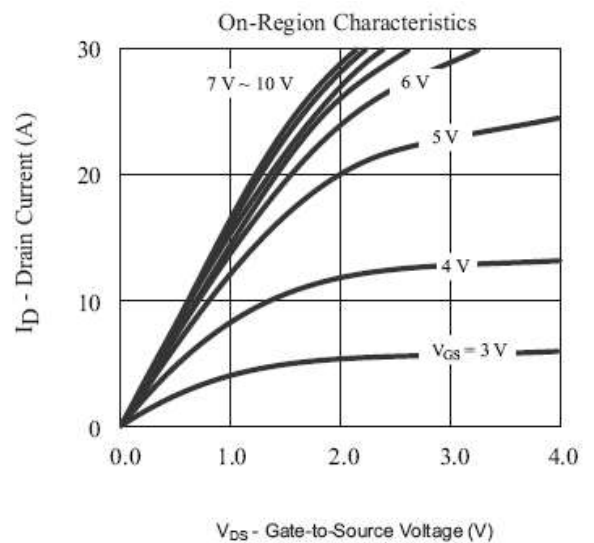
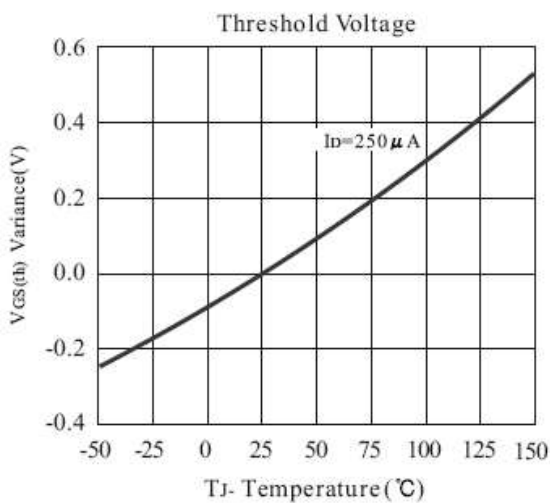
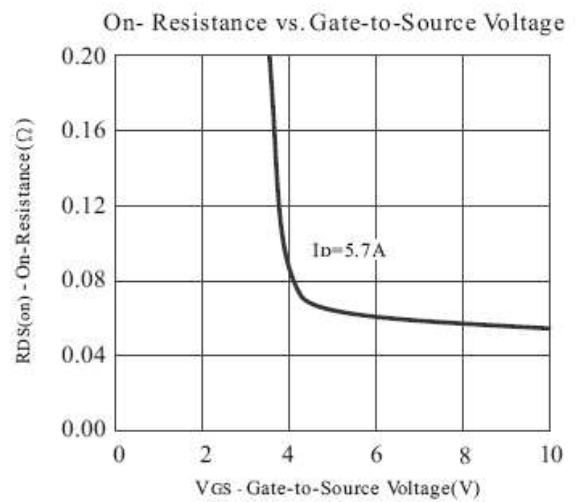
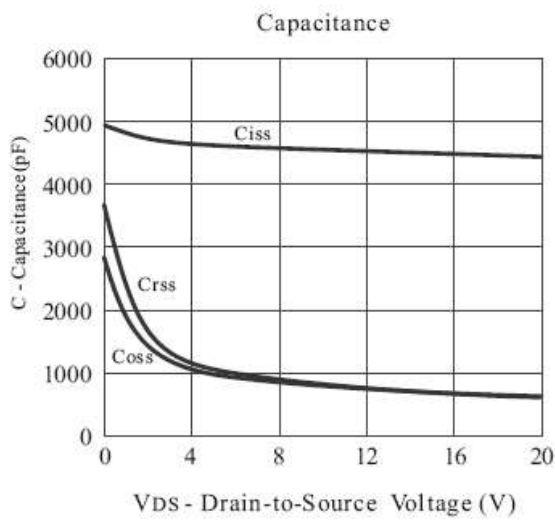
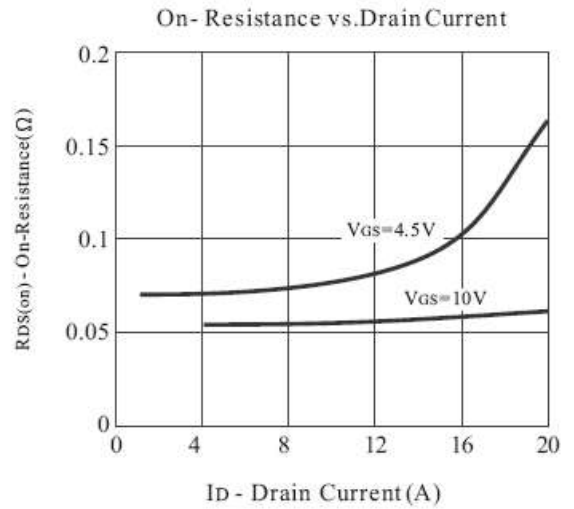
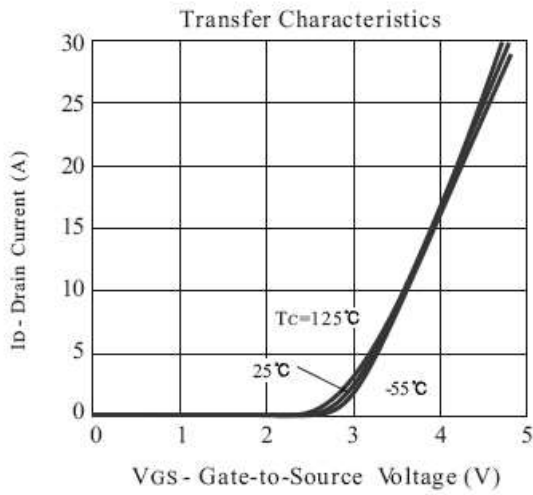
● **Electrical Characteristics** @ $T_A=25^{\circ}\text{C}$  unless otherwise noted

| Symbol         | Parameter                       | Conditions   | Min  | Typ  | Max  | Units      |
|----------------|---------------------------------|--|------|------|------|------------|
| <b>Static</b>  |                                 |  |      |      |      |            |
| $B_{V_{DSS}}$  | Drain-Source Breakdown Voltage  | $V_{GS}=0V, I_D=-250\text{ A}$   | -30  |      |      | V          |
| $R_{DS(ON)}$   | Drain-Source On-Resistance      | $V_{GS} = -10V, I_D = -5.3A$   |      | 45   | 55   | m $\Omega$ |
|                |                                 | $V_{GS} = -4.5V, I_D = -4.2A$  |      | 65   | 75   |            |
| $V_{GS(th)}$   | Gate-Threshold Voltage          | $V_{GS} = V_{GS}, I_D = -250\text{ A}$   | -1.0 | -2.2 | -3.0 | V          |
| $I_{GSS}$      | Gate-Body Leakage               | $V_{GS} = +20V, V_{DS} = 0V$   |      |      | +100 | nA         |
| $I_{DSS}$      | Zero Gate Voltage Drain Current | $V_{DS} = -24V, V_{GS} = 0V$   |      |      | -1   | A          |
| $g_{FS}$       | Forward Transconductance        | $V_{DS} = -15V, I_D = -5.3A$   | 4    | 7    |      | S          |
| <b>Dynamic</b> |                                 |  |      |      |      |            |
| $Q_g$          | Total Gate Charge               | $V_{DS}=-15V, I_D=-5.3A, V_{GS}=-10V$  |      | 9.52 |      | nC         |
| $Q_{gs}$       | Gate-Source Charge              |  |      | 3.43 |      |            |
| $Q_{gd}$       | Gate-Drain Charge               |  |      | 1.71 |      |            |
| $t_{D(on)}$    | Turn-On Delay Time              | $V_{DD} = -15V, R_L = 15\ \Omega, I_D = -1A,$<br>$V_{GEN} = -10V, R_G = 6\ \Omega$ |      | 34.5 |      | ns         |
| $t_r$          | Turn-On Rise Time               |  |      | 18.6 |      |            |
| $t_{D(off)}$   | Turn-Off Delay Time             |  |      | 37.1 |      |            |
| $t_f$          | Turn-Off Fall Time              |  |      | 3.1  |      |            |

Notes:

1. Pulse width limited by maximum junction temperature. Pulse test:  $P_W \leq 300\ \mu\text{ s}$ , duty cycle  $\leq 2\%$ .
2. For design AID only, not subject to production testing. Switching time is essentially independent of operating temperature.

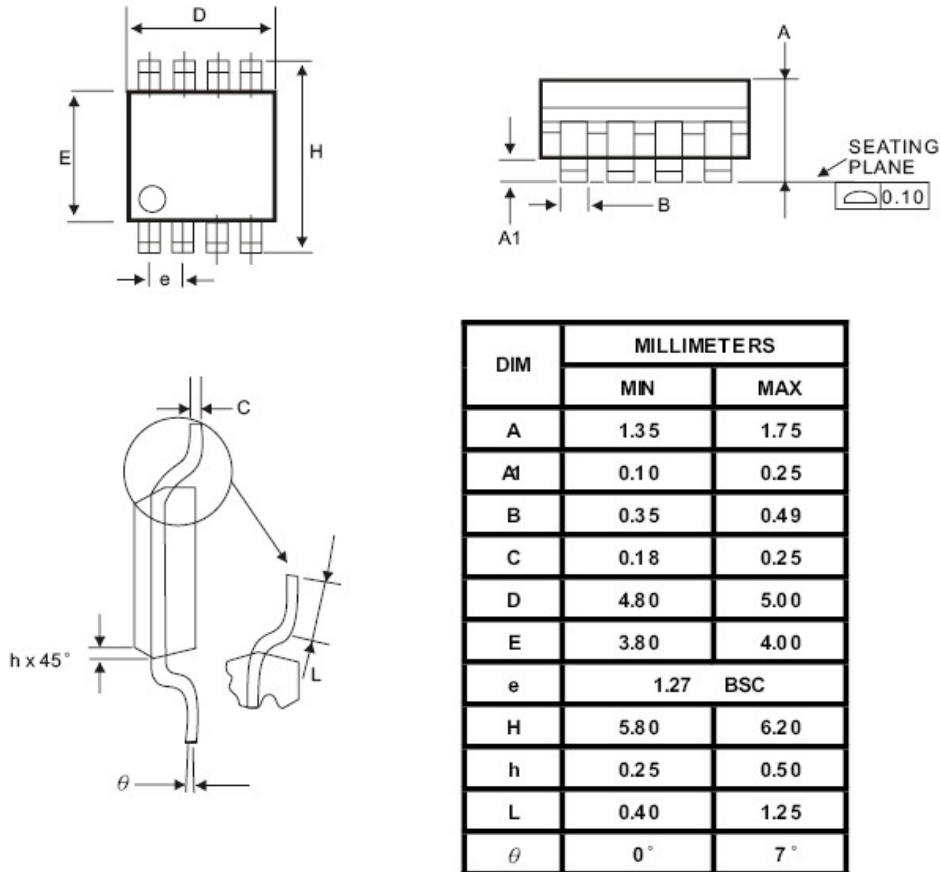
● Typical Performance Characteristics



- **Package Information**

Physical Dimensions inches(millimeters) unless otherwise noted

## SOP-8



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